

## ENDOCRIN COMPONENT EVOLUTION IN PREPUBER TESTICLE IN FEW MAMMAL SPECIES

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**Abstract:** In prepuber animals; endocrine component is different with age and specie. In two weeks old pigs; respectively 2-3 months; the endocrine component is representing aproximately 50% of the section surface; in order to decrease at 4 months to 40%; and to represent 15% at 6 months. In 2 weeks and 2-3 months old rabbit the endocrine component is representing 5%; while at 6 months 10%. In 2 weeks tomcat the endocrine component is representing 50%; at 2-3 months is decreasing to 5%; to increase at 10% in 6 months old tomcat.

### INTRODUCTION

The period among birth and puberty is covered by the literature with little; unclear and contradictory data. The existing ones are aiming humans and species easier to be investigated; such as mouse and rat.

Considering this we performed histological investigations on impuber males from non-related species; choosing a rodent (rabbit); carnivore (tomcat) and an omnivorous (boar); distinct animals in many senses: behaviour; alimentation; growth; height; etc.

We aimed the investigation of the endocrine component in the first month after birth; the differences among the studied species; and their evolution until the age of 6 months; for each specie taken into study.

### MATERIAL AND METHODS

The biologic material used in this study was represented by testicles collected from impuber males from the following species: swine; leporidae and feline. The next periods were chosen in order to cover the interval between birth and puberty: first month; 2-3 months; respectively 4-6 months old.

Males were emasculated and testicles fragments were fixed after the collection in Stieve mixture for 24 hours. After the paraffin inclusion the pieces were cut in sections of 5  $\mu$ m thin; while for contrast two staining techniques were used: Masson tricrom; modified by Goldner as topographical staining and Heidenheim ferical hematoxin for division cells and secretion granules in interstitial cells cytoplasm emphasize.

### RESULTS AND DISCUSSIONS

At two weeks; the interstitial gland is developed and mostly formed of long cellular belts at the level of the interlobular sept and short belts; ramified through the seminal belts. The endocrine component is very developed; filling at least 50% of the organ structure; reaching even more in some of the areas (fig.1). The vascularisation is very good represented;

vessel of small caliber disposed both around the seminal belts and in contact with the endocrine cells.

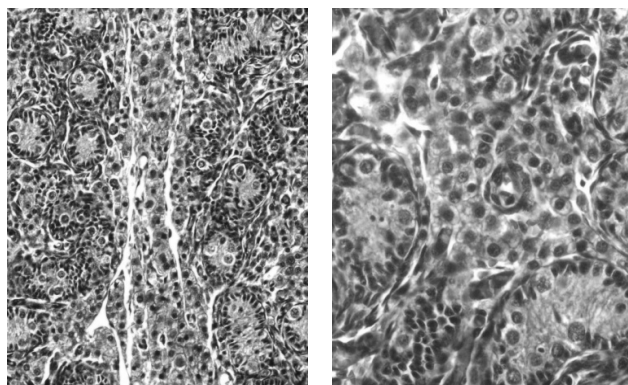


Fig.1 Endocrine cells disposition at septa and lobelets level  
(Tricrom Goldner; ob. 10X; 20X )

In small number; divisions at the endocrine component were observed. Heidenheim ferial hematoxilin staining is evidentiating the presence of numerous granules inside the endocrine cells cytoplasm; suggesting an intense secretor activity (fig. 2).

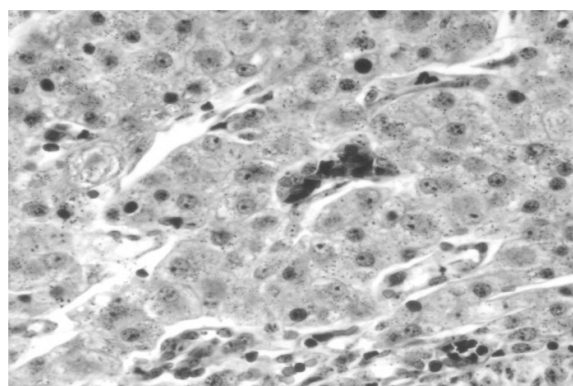


Fig.2. Secretion granules inside the interstitial cells  
(Heidenheim ferial hematoxilin; 40X)

At 2 months; interstitial gland aspect and extension degree is preserved. Heidenheim ferial hematoxilin is evidentiating divisions in small number compared to 2 weeks old pig. Inside the endocrine cells cytoplasm secretion granules also exist at 2 weeks old pig; although the secretory activity is at a lower level.

At 4 months; the endocrine component is well represented; arranged as long parallel cells belts; but also as ramified belts among the seminal tubes seizing third of the section surface (fig. 3).

At 6 months the ratio of forces between the exocrine and endocrine component is favorable to the first one; although the endocrine component is still good represented. At the level of the endocrine component inside the cells cytoplasm; the presence of the secretion cells is observed.

At 2 weeks old rabbit the exocrine component is represented by the seminal belts; conjunctive tissue better represented respect to pig and a small number of cells; probably

endocrine ones. The vascularisation is also good represented but reduced compared to pigs of the same age (fig. 4).

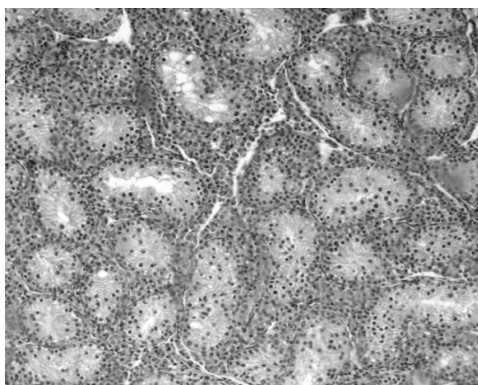


Fig.3. 1:2 ratio between the components  
( Tricrom Goldner; ob. 10X )

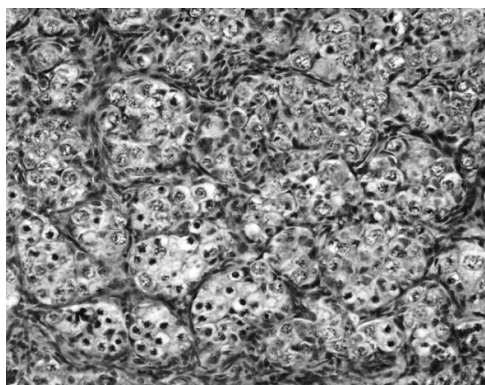


Fig. 4 The aspect of the seminal belts in 2 weeks old rabbit  
( Tricrom Goldner; ob. 10X )

At 2 months old rabbit the endocrine cells; reduced as number are presenting intra-cytoplasm granulations; but reduced compared to 2 weeks old rabbit. At 6 months old rabbit; the endocrine component is represented by the cells grouped among the seminal tubes. The endocrine component is better represented comparatively to younger animals; but not as developed as in pig.

At 2 weeks old tomcat the endocrine component is represented by cells as long belts between the lobules and ramified belts inside the lobules through the seminal belts; the report between the components being 1 on 1 (fig.5). The endocrine cells are presenting inside the cytoplasm less granulations respect to the same age pig.

At 3 months old tomcat the endocrine component is reduced to short belts or small cells groups situated in the interstice. Inside the cells cytoplasm; secretion granules are observed; but their number is reduced. Vascularisation is good represented.

At 6 months old tomcat; a particular aspect is represented by the presence of endocrine cells at the periphery; towards the albuginea and in its thin; forming long belts; small groups and endocrine cells cluster (fig.6). Inside the endocrine cells a small number of secretion granules are observed.

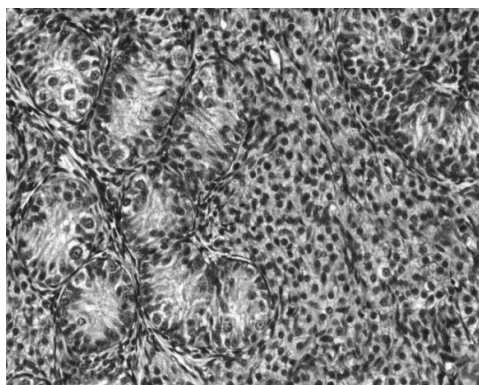


Fig.5 2 weeks old tomcat testicle  
(Tricrom Goldner; ob. 10X)

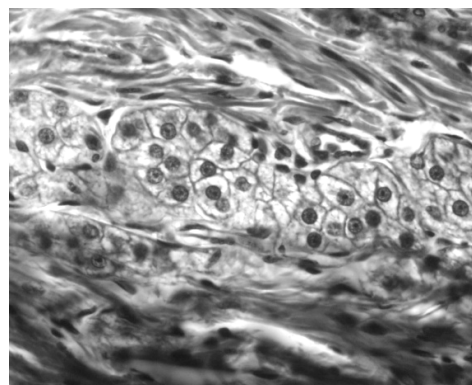


Fig. 6 Endocrine cells in albuginea thin  
(Tricrom Goldner; ob. 40X)

The researches are illustrating some differences in the studied species compared to the literature data. Leydig cells (interstitial) appears within the eight week of intra-uterus life; have a fast proliferation reaching the maximum level between weeks 14-16; in small number at the eight month; while at birth they completely disappear (Dumitru and col.1977). The same authors are mentioning that a new Leydig cells generation appears at puberty; so between birth and puberty testicles are free of interstice endocrine cells. Considering this data refers to human specie; with no possibility of investigation; we accept the data; mentioning that in animals the situation is very different.

At the animal species studied the situation is different compared to the literature data referring to human testicle; although there been some important differences among the studied species. A close situation to the human report was the rabbit situation. At 2 weeks Leydig cells are in small number; at 2 months the situation is almost unchanged; while at 6 months when the spermatogenesis process is triggered; their number increases without reaching huge levels (mostly 10% of the section surface).

Based on the results obtained in rabbit we can not contradict the literature data or pretend that between the two species important differences exist. An intermediary situation is find in tomcat that at 2 weeks Leydig cells are dominant filling 50% of the testicle surface. At 2 months they decrease reaching 5%; while at 6 months their percentage is 10%. At 6 months in tomcat testicles the spermatogenesis process is not triggered yet. The existence in high number of endocrine cells in the first month is negating their disappear soon after birth. Their number decrease; but much later; without disappearing.

A very different situation is encounter at pig testicle. At 2 weeks the Leydig cells are numerous filling 50%; at 2 months they maintain the comparable level; at 4 months decrease to 35-40%; while at 6 months their percentage is 15. At 6 months in pig testicles the spermatogenesis process is not triggered yet. Based on the results obtained at the first studied specie we can not affirm that Leydig cells do not disappear after birth; at the second specie their decrease is observable in the second month.

The situation is better represented in pig; where Leydig cells are many (at least 50% of the testicle surface) at birth; maintaining at the same level at 2 months; decreasing with 10-15% at 4 months while at 6 months (puberty) the percentage is 15. For this specie the problem of Leydig cells embryo disappearance and new puberty generation appearance is not valid. In animals the situation is totally different to humans; or the literature data are not exact. For a better understanding of the results the next table is concluding:

Table 1;

The evolution of the endocrine component in impuber animals

Specie	Age			
	2 weeks	2-3 months	4 months	6 months
Pig	50%	50%	40%	15%
Rabbit	5%	5%	-	10%
Tomcat	50%	5%	-	10%

The aspects are proving that in this domain the facts are far from being cleared; at least in animals; but most probably in humans too. We recommend comparative study considering the importance of the aspects regarding the testicle; an essential organ for species reproduction.

## CONCLUSIONS

- The endocrine component is different for the three studied species; but does not disappear at one moment as the literature data is mentioning.
- The interstitial cells are in small number at 2 weeks old rabbit; maintaining at low levels to puberty; when their number might increase.
- At 2 weeks old tomcat the interstitial cells are many; decreasing at 2 months and increasing again at 6.
- The pig is presenting the most developed endocrine component from the first month of life to puberty.
- The results of this study are questioning some information of the literature; proving that in this domain the facts are far from being cleared; at least in animals; but most probably in humans too.

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